- Yes. The applicant agrees to this provision. It has been stated within the proposed written restrictions for the property. In addition, the applicant and Staff have proposed a monitoring program that will ensure compliance with federal standards.

5. **The written restrictions must state that at such time as there have not been any antennas on a tower or the use of the tower has been abandoned for 6 consecutive months, it will be removed within 180 days of the end of said six month period.**
   - Yes. This has been stated in the proposed written restrictions and the applicant agrees to the requirement.

COMPATIBILITY:

The siting and placement of the consolidated tower will occur in an area that has historically maintained these types of facilities. This request creates a new tower on Lookout Mountain placed on the eastern slope west of the ridgetop. The tower will accommodate a multitude of antennas and ancillary equipment used in the operation of broadcasting and telecommunication. Design criteria have been incorporated into the proposal to reduce visual impacts associated with the transmitter building, including terracing, color schemes and use of materials. Dishes and auxiliary equipment mounted on the building will be painted to match the surrounding vegetation and topography. The placement of the tower and building within the site occurs away from nearby residential development. The proposed consolidated tower in this location is compatible with the overall appearance and use of Lookout Mountain for telecommunication operations. The multi-use tower is located within a major use transmission area which is in close proximity to other comparable structure. For all of these reasons the proposal can be considered compatible with the surrounding area.

COMMERCIAL MINERAL DEPOSITS:

There are no known mineral deposits of economic significance on the property.

FINDINGS/RECOMMENDATIONS:

Staff finds that:

1. **The proposal is not in substantial conformance with the Central Mountains Community Plan or Telecommunications Land Use Plan because it does not entirely conform to the policy recommendations associated with visual resources, public facilities/service, mountain site design criteria, and tower siting. If the proposal is APPROVED, it could comply with policy recommendations by meeting the conditions of approval identified below.**

2. **The proposed land use is compatible with existing and allowable land uses in the surrounding area in all directions because construction of a consolidated tower will reduce the overall visual impact of broadcast facilities on Lookout Mountain by eliminating several towers. The proposal incorporates design criteria that blend the proposed transmitter building into the hillside and is consistent with the nature of this area for broadcast and telecommunication operations.**

3. **No known commercial mineral deposits exist upon the subject property.**

Staff recommends that Case No. 98015154RZP1 be CONTINUED to resolve issues with ice fall materials and debris from tower failure or collapse. If this issue is resolved to the satisfaction of the Board of County Commissioners, we would recommend APPROVAL based on the following conditions[3]:

1. **The written restrictions and Development Agreement shall clearly establish the removal of the towers (associated with Phase II - Channels 7 and 9) by the end of the year 2006 when analog TV is phased out, unless time is extended for good and sufficient reasons deemed to exist by the then current Planning Commission and/or Board of County Commissioners.**

2. **Any new antennas associated with the proposal or added in the future must receive the necessary permits from the Planning and Zoning Department and have all required information on compliance with county, state and federal standards.**

3. **The monitoring plan for this proposal shall include a provision for citizen involvement during the confirmatory sampling done if RF standards are exceeded.**

4. **No additional FM antennas can be added to the existing analog television towers.**

5. **The proposed transmitter building shall be colored to be of nonreflective materials.**

6. **The proposed building shall be located closer to the tower to reduce the size of or eliminate the "ice bridge" associated with the proposal.**

7. **Revisions to the Official Development Plan and Written Restrictions in accordance with the red-marked print dated January 13, 1999.**

PC RECOMMENDATION (Resolution Dated January 13, 1999, Attached):

Approval	
Approval with Conditions	X
Denial	

On January 13, 1999, the Planning Commission passed a motion recommending approval of this case with a 5-1 vote. One of the major concerns expressed by the Planning Commission, and as noted in these comments, is the size of the proposed equipment building.

COMMENTS PREPARED BY:

Timothy W. Carl, Planner

2.26.99

[3]These conditions reflect, in part, conditions established by the Planning Commission during their review of this proposal.

Appendix U

Transcript of Video
"Broadcast Blues"

N1 All the earth's species and the entire human anatomy have evolved over millions of years in a highly protective electromagnetic envelope. Birds, dolphins, sea turtles and butterflies are all thought to use emanations from the earth for navigation. But the electromagnetic signature of the earth has been changed by everything from radios to Tvs to cell phones. So if we are so finely attuned to our electromagnetic environment, a question arises: What, if anything, are we doing to ourselves with this barrage of artificially generated energy?

RADIO SOUNDS

Ron: Can't see it, you can't feel it, you can't sense it in any way.

Carol: And if you don't see it or smell it, you know, why worry?

Cohen: Electromagnetic radiation has not been shown to cause cancer.

Bull: See, the problem is, you don't know.

Voice: These are the unwarranted fears of a handful of hysterical residents.

Blake: Primary brain tumors in America have increased four fold.

Cohen: Cancer mortality with the exception of lung cancer which is smoking related has been coming down since the late 1960's and coming down sharply.

Ragonetti: There is a federal mandate, a congressional act, which requires television stations to go on the air with digital television starting in 1999. It is an exciting new technology which dramatically improves picture resolution.

Roger: But at what cost? And who is paying for it? Who is paying the bill?

Cohen: So there is no relationship between human exposure to radio frequency energy and our cancer experience.

Deb: Science and government are saying that until you can bring us the bodies, we won't do anything.

N2: Denver broadcasters, including the affiliates of NBC, ABC, CBS, UPN and the local PBS affiliate- a coalition called the Lake Cedar Group- face a mandate from the Federal Communications Commission to begin high definition television broadcasts in

November of 1999. To accomplish that they propose a new tower on Lookout Mountain 2,000 feet above the city.

N3: The residents of Lookout Mountain see the proposed new tower as a new health hazard added to an existing health hazard. And while they may take the threat very personally, and may face more concentrated radiation than most areas, growing levels of radio frequency radiation are seen in every city in the nation.

Mattson: There is nobody looking our for the safety nationwide. And if citizens are concerned about their safety, they're going to have to do what this community in Jefferson County, Colorado did, which is look out for themselves.

Steve Howards: We're dealing with a type of pollution here that can cause people to die. That's serious stuff. That's serious stuff. And when you start realizing that those risks are being imposed upon our children. This isn't like cigarette smoke where if you don't want to be around cigarette smoke, you can move to another room. Or here, you know, you are exposed to the stuff whether you want to be or not.

Susan: I got concerned when I realized that from our house to the Lookout Mountain towers, there was a line of cancers that I could identify. Since we moved to our house, which is the gray house down there, my husband was diagnosed and treated for leukemia which is one of the cancers that is associated with this kind of radiation. Our neighbors directly next to us, behind us, toward the towers, Pete Bates, has been struggling with a cancer of the face and neck in here, and as you cross the street there is the Gerstler house. Marcus Gerstler was diagnosed and died of a brain tumor, another cancer that has been directly linked to these kinds of radiation about a year and a half ago. And then as you keep going directly next to, across from them, toward the towers, a gentleman died from a brain tumor I think about four years ago. And then as you cross that street, you're directly on the ridgeline towards the tower, someone on line died of cancer not too long ago. It's just, it's, it's too much to be a coincidence.

N4: Former cameraman and director Jim Lilja offers another perspective.

Lilje: Oh that's a tough one. As I understand it, by and large, the TV towers were there before a lot of the present housing was there. And if that's true, then I think the broadcasters have every right to be up there. I think it would be fair to say this is not unlike somebody who chooses to build a house next to an airport and complains about the noise from jet airplanes.

Carole: It's a common perception that the towers were here first that the people came later. And it's just simply not true. There were 350 homes up here when the first tower went in 1953.

N5: Carole Lomond, publisher of a local paper, City and Mountain Views, has written extensively on the history of the tower farm on Lookout Mountain...

Carole: This whole area was platted for homes by 1924. The population grew as the towers grew. In 1979 there were an estimated 100 transmission devices up here and in 1996 it's been estimated that there are about 450. The population went from 350 in 1953 to presently 3000. And half of those three thousand family homes are at the same altitude as the transmission devices.

N6: Most of the residents now living on Lookout Mountain assumed the area was safe when they moved there.

Pete: We were never concerned with the towers and any harm from the towers resulting in cancer or anything. We completely ignored the towers.

N7: Lookout Mountain resident Ron Larson is a retired professor of electrical engineering.

Ron: The issue is I'm now realizing is not one so much of electrical engineering, certainly not thermal analysis, thermal studies so it's a very complicated subject. I think that we may well be in danger at this point but can't prove it.

N8: Karen Bull and her family moved to Lookout Mountain in the mid '80s. She was the first person to question the safety of the antenna farm.

Karen Bull: Amongst other things I checked out the water of course, checked out the schools, checked out the neighborhood and we knew the towers were there so we checked out the towers. We talked to our county health department, I talked to EPA and talked to the FCC. Everyone at all levels, they assured me that we were perfectly safe here that there was no cause for concern.

Carole: And we heard about Karen Bull who was a homemaker that lived near the towers who had been an activist on this issue. We went to meet her and we were just astounded. I mean the issue possessed her. And here was this incredible mother, homemaker trying to dig her way through, trying to find this information and trying to get support for doing something about these antenna farms all by herself.

Karen Bull: They put Channel 50 on the Channel 2 tower probably 150 feet off the ground and that's a two point, two and a half, it's broadcasting 2 1/2 million watts of power about 150 feet off the ground basically right into the Buffalo Bill area. They weren't allowed to add a new tower or new antenna to that tower without getting permission and they were doing it. And so they didn't like the fact that we were up on a public road taking pictures. They came up and basically told us to quit and we said no, we had a right to be there, they said well, we know your license number and we know where you live. So we of course considered that a threat. When they're taking about adding HDTV up here not only is that additional RF but it's a new source. And I don't think they have any idea if that's going to cause a different type of disruption.

N9: What Bull and the others were concerned about was the electromagnetic radiation coming from the radio and television antennas. To better understand this form of radiation, it helps to know what else is part of the electromagnetic spectrum.

X-rays and gamma rays for example are an ionizing form of radiation. Ionizing radiation is capable of damaging the cells of living organisms without heating them.
At the other end of the spectrum is non-ionizing radiation. It includes visible light, microwaves and signals from cell phones, television and radio transmitters.

Experts agree that non-ionizing radiation at high intensities can cause adverse health effects by heating the body- what's known as the thermal effect. That's why we have standards for leakage from microwave ovens and for radiation from broadcast antennas.

We can divide electromagnetic radiation into four categories:

One category is radiation that is athermal- meaning it does not heat the body-- but is ionizing--meaning it can damage cells. An example would be x-rays.

Another category is radiation that both heats the body and damages cells. An example would be extensive exposure to x-rays. All ionizing radiation is strictly regulated.

A third category is non-ionizing radiation at a high enough intensity to heat the body. Very intense exposure to radio and TV signals are examples of this type of radiation. These categories have been studied extensively and standards have been set to limit human exposure to such radiation.

What Lookout Mountain residents are concerned about is the fourth category, non-ionizing radiation that is not intense enough to heat the body. Relatively little research

has been conducted on the biological effects of chronic exposure to this type of radiation.

The FCC safety standard for broadcast antennas in the United States depends on frequency and is at least 200 microwatts per square centimeter. This standard is based on the belief that there is no harmful effect at levels too low to cause a thermal effect. But other governments have much more stringent standards and some scientists now believe they can show cell damage even when there is short term exposure at levels well below the current FCC standard.

N10: Prompted by Lomond's articles documenting that the antenna farm has grown from one tower with a couple of antennas in 1953 to 19 towers and more than 450 antennas in 1999, Al hislop, an electrical engineer and Lookout Mountain resident, buys a radio frequency survey meter and begins taking measurements.

Hislop: Nobody in the area really had a good idea about what was going on, what were the items that were causing the real problems in the neighborhood, whether they were TV stations or FM.

N11: Hislop finds five locations at the Lookout Mountain antenna farm that exceed the FCC limits-- some by as much as 250 percent.

Hislop: When I first discovered that the levels exceeded the federal standards and reported this to the FCC, I thought that the FCC would jump right on it and be out there to protect the citizens. The FCC checked again with the broadcasters, asked the broadcasters "Are you sure you're not over the level?" The broadcasters said, no, we're not over the levels.

N12: After repeated complaints to the FCC and denials by the broadcasters that they are operating over the established limits, Dr. Robert Cleveland of the FCC comes to Denver to settle the dispute. He is accompanied by Bob Weller, the engineer working for the broadcasters whose measurements had showed that the towers were in compliance.

Reporter: A couple of basic procedure questions. I understand you rarely come out and do this, measure this? Why are you out here today?

Cleveland: We do this when there is a problem that can't be resolved otherwise. We don't have the funding or the resources to go out and routinely make these measurements.

Reporter: The citizens are measuring one thing and the stations are measuring another?

Cleveland: Well, this situation you've got contradictory results it seems, it seems. The Hislop group here and the Tell study although I'm not sure if he came right here, and Bob Weller, some of Bob Weller's measurements, there seems to be not complete agreement about what exactly are the exposure limits in these public areas. So in order to try to resolve that, that's why we're here. And the other reason is, it turns out that the money to come out here is not too expensive because there are some government airfares for example to Denver that are reasonable. We don't have a lot of money.

Carole: Who is responsible for monitoring?

Cleveland: As far as routine monitoring, I can't guarantee that there is any, that there is going to be any.

Carole: Is the county then be...?

Cleveland: Well if the county wanted to, they could. They could come over here and if they find, found a problem, then they could notify us. Now that Mr. Hislop has his equipment, if he were to find something, he could tell us. But basically, we don't have the resources to come out and do routine monitoring.

Hislop: Essentially, there is no provision for monitoring, so when you say that if there is evidence of a problem, there really wouldn't be any evidence of a problem unless somebody came out and did it.

Cleveland: If for example, somebody did some new calculations, maybe somebody decided that there was something wrong here that hadn't been properly analyzed.

Reporter: I'll cut to the chase here. I'm five months pregnant. Should I not be here?

Cleveland: If we're over the limit here, you shouldn't be here longer than 30 minutes. Let's put is that way. According to the standards.

N13: As the day progresses, it becomes apparent to Cleveland that the broadcasters' consultant has overlooked all the hot spots Hislop had found. Electromagnetic radiation levels on Lookout Mountain are clearly out of compliance.

Cleveland: What about up there? Did you go on that road?

Weller: Yeah, yeah, absolutely.

Cleveland: You didn't find any of this?

Weller: Well, I found, I found these spatially peak hotspots but I did not find anything that's spatially averaged and I surveyed this.

Hislop: It seems like if a couple of amateurs can go out and do it in two hours that professionals over a matter of years ought to be able to pick this up.

Weller: I was here for two days and I covered virtually every inch up here. I definitely would not have missed this.

N14: How could the engineer for the broadcasters have overlooked the sites that don't comply? Bob Weller explains his oversights.

Weller: There are at least five possibilities. Something's changed in the environment at the site in terms of the moisture content, in terms of the buildings or structures that are here. Something's changed in terms of the sources at the site which would include differences in power levels of antennas, changed power levels. New antennas up here, things of that nature. A third possibility is that there is something different about my instrument that I used in October of '97. A fourth possibility is that there is a difference in the spatial averaging technique between what I use and what the other folks, guys use but I now concede that there is not. And there is a fifth possibility. I've thought about this for awhile. Ah, the fifth possibility is that I just didn't survey in the areas where these peaks were found but now that I'm here, clearly, I did.

N15: Not only are the broadcasters caught out of compliance, it is revealed that the FCC and the county have ben relying on measurements submitted by the broadcasters. It is a classic case of the fox guarding the hen house.

Lomond: It was an incredible situation. The county wasn't monitoring the RF levels. They were depending on the FCC and basically the FCC apparently was going by measurements that the industry turned in to them. So it was up to the broadcasters' engineer and of course he didn't want to find the broadcasters out of compliance so he blamed the faulty meter. The bottom line is no one is watching the store. No one is monitoring this industry.

Speaker??: I think in this battle what's at stake is it becomes a less desirable place for

people with children and it just becomes a place where there are some houses. I certainly wouldn't want to live here under those conditions.

Lauren: The wild life is one reason we live up here. We came out of our house the other day and there was an elk across the driveway and our cat sneezed and the elk jumped and that's how close the elk was.

N16: Until this time, few residents of Lookout Mountain have thought of the towers as a health hazard. Most assumed that the FCC and the county were looking out for their safety.

Patty: It really was an eye opener. We'd always been a little leery of the towers. We're a mile and a half away. We thought that would be maybe a safe distance. But we began learning more and the more we learned, the more I talked to my neighbors, the more upset they got.

N17: The towers are perched on a ridge 2,000 feet above the city of Denver, but unlike most antenna farms, it is surrounded by terrain of equal or higher elevation. At these higher elevations are the Ralston Elementary School and hundreds of homes-- putting them directly n the stream of radiation emitted by the antennas.

Barker: When I learned that the electromagnetic radiation here at Ralston Elementary was going to go up by 15 times what it was before, I was irate. That means that it's 7.48 microwatts per centimeter squared and I know that in Russia the maximum is five. Now, this is not only unacceptable but it is frightening so I helped mobilize the Ralston community, educate the parents, and I think we sent a very powerful message to the board of commissioners.

Ron: We could see that if there was going to be a noise made, it was going to have to be citizens who made that noise.

Debosky: The most impressive victories of citizens around the country who are fighting broadcasters and powerlines and these corporations is citizen action.
There are lots of guerilla tactics leftover from the 60's and 70's that are very effective.

N18: What the residents of Lookout Mountain need is a leader who understands the complex issues and has the skills to champion their cause. They find such a person in attorney Deb Carney.

Deb: And we need your voices. I thought as long as we were within the FCC limits, everything was fine. I didn't think much of it. And then a beloved neighbor died of brain cancer. I started looking at some of the studies and I started getting concerned. And the more I looked, the more troubled I got.

N19: Community leaders realize that if they are going to prevent the new HDTV tower from coming in, they need to take action on several fronts. A steering group is formed consisting of attorneys, engineers and citizen activists.

Deb: Community meeting on those towers.

Citizen: We'll be there, especially me cause I live right across the street.

Deb: Thank you, appreciate it.

Karen Griffin: The mothers' march was to put face with the cause. It was families, it was mothers, it was their children. They showed the commissioners that we are not an angry crowd, we are a concerned group and we are going to act with proper decorum to get our point across.

Child: I'm not a ...

Voice: You're not a what?

Child: I'm not a lab rat.

Karen Griffin: The petition with signatures was something that had been accumulated over a period of several weeks and it was over 3000 signatures from homeowners who were wanting to let the commissioners know that they were not happy with what was happening with radiation levels on Lookout and they did not want any additional radiation on Lookout Mountain.

Deb: We had a gut feeling that we had an unusually high number of brain cancers here. Proving that this high number of brain cancers was caused by any particular thing such as the radiation is difficult and that's why we need more studies.

N20: One step the steering committee can take is to find and document people who have been diagnosed with cancer and other malignancies.

Cathy Morgan: I actually don't want to believe that living in a Paradise like this causes

cancer.

Paul Copper: And we thought that we'd found the home of our dreams.

Robin Gerstler: Mountainous terrain... we were both avid runners.

Pete Bates: And we've lived here 34 years.

Lee Todd: 26 years

Cathy Morgan: And when I heard non-hodgkins lymphoma I just started to shake.

Robin Gerstler: Diagnosed with a malignant brain tumor, primary site, it was called a glioblastoma technically.

Paul Kopper: She was diagnosed as having a glioblastoma.

Robin Gerstler: I believe strongly in sound scientific evidence. I'm not prepared at this point to say where the cancer came from.

Andy Beck: Something I can't put my finger on. Could it be electromagnetic radiation? Maybe. Maybe so. I wish I could nail it down.

Cathy Morgan: From what my oncologist tells me, they're not really sure. And the other thing, ... it's just a mutation of the genes, for some reason it occurs.

Pete Bates: That's something I've been thinking about ever since last summer when I had surgery performed.

Robin Gerstler: Marcus was 34 years old when he passed away.

Cathy Morgan: It's a cancer of the lymph system. It's not operable, treated through chemotherapy and radiation. It's what King Hussein just died of. The King and I.

N21: Despite strong suspicions and compelling testimonials, the evidence of the citizens is anecdotal and far from scientific. It will be of little value in their confrontations with the broadcasters. Before the case is heard by the Jefferson County Planning and Zoning Commission, Blake Levett, author of Electromagnetic Fields, A Consumer's Guide to the Issues, meets with the steering committee.

Blake: The problem is that it's very difficult to prove cause and effect when it comes to the energy modalities. The brain tumors are probably going to begin, they probably already are beginning to show up in cell phone users. It's going to take probably 10 to 15 years for it to show up in those who live near the cell towers more than likely. And then it's going to take another two years to gather the data, it's going to take another three years for peer review, it's going to take another four years to end up in the journals. So we're twenty years away from holding this industry accountable. In the mean time, do the math. There's billions of dollars at stake that they're going to rake in. They very cynically know how long it's going to take to prove this.

N22: Getting the Lookout Mountain community to agree about an issue as intangible as the potential danger of electromagnetic radiation is a large order. To beat the broadcasters, they need to raise money, agree on expenditures and share a common strategy.

Steve: I'd like to spend time talking about what to do about it. Right now there are two issues.

Carole: First you have to define the problem.

Steve: Right now there are two issues on the table, guys.

Jan: You're too nice and I've told you this for six months. You are way too nice and you try to reason with people. You just have to call a spade a spade.

N23: Two weeks before the Jefferson County Planning Commission is to hear the case for the new tower, the FCC returns to Denver with solutions to bring the antenna farm into compliance with the national standard. The FCC has ordered that areas measuring more than the established maximum of 200 microwatts per square centimeter be fenced off.

Hislop: It's been a year since we reported these excesses and according to the FCC and according to the county this fence is of sufficient size and strength to prevent access by the public.

N24: The Lookout Mountain residents are up against the wall. The broadcasters have deep pockets, legal clout, solid connections with the FCC in Washington. They are represented by the esteemed Denver attorney, Tom Ragonetti.

SUBTITLE: PUBLIC HEARINGS

Ragonetti: There are two fundamental reasons for the application. One is that each of the television stations in Denver, these five and others, are under a mandate from the Federal Communications Administration to provide digital television and its benefits to the public.

Deb: We are the most radiated community of residents in this country.

Cohen: I think that you can take particular confidence in the measurements made by the Federal Communications Commission.

Hislop: The FCC failed to take any action for more than one year until those excessive levels became public knowledge.

Cohen: Hammett and Edison, the firm with which Mr. Weller is associated has a deserved reputation for the thoroughness and accuracy of its work and Mr. Weller is certainly continuing that tradition.

Weller: Despite diligent efforts to utilize calibrated properly functioning equipment for RF exposure surveys, it appears that an undetected failure of one of my firm's meters prior to the 1997 measurements, occurred. This failure accounts for the discrepancy.

Hislop: I happen to own the exact same make and model of measuring equipment that Mr. Weller had, and I know that that measuring equipment has built in test equipment which is designed to show the operator if a malfunction has occurred.

Ragonetti: We firmly believe that we have met both the spirit and the substance of the county's telecommunications plan and their PUD ordinances for a new telecommunications tower.

N25: By a six to one vote, the Planning Commission sides with the broadcasters. Citizen concerns about the health hazards and the broadcasters' failure to accurately report radiation levels and comply with FCC standards fail to persuade the commissioners.

N26: Clearly stung by their defeat in front of Planning Commission, it becomes clear to the Lookout Mountain residents that they must sharpen their attack and broaden their appeal. The place they decide to start is at home.

Deb: It was a shock to see how the Planning Commission had misunderstood some of

the things we had tried to explain and we realized that we had to attack this on many different fronts.

PIZZA Rick: Come on guys, come and eat.

AUCTION SOUNDS

N27: Community events: Tee-shirt sales. A graphics campaign. Fundraisers. Developing political support. Auctions. Computer simulations. Protests. Community education. It's all a part of the necessary consensus building.

Patty: One of the members of CARE has been working on standards for EMR, electromagnetic radiation around the world. He starts on his summary page with 200 as the standard in the United States, 200 microwatts per centimeter squared. Italy and Poland are twenty times lower with 10 microwatts per centimeter squared. Some of our neighbors are above that. Forty times lower in Russia at 5 microwatts per centimeter squared. Our house is above that. A hundred times lower in Moscow at two microwatts per centimeter squared. Four hundred times lower in the USSR, 700 times lower is being discussed in the European Union at .3 microwatts per centimeter squared. And we're finding interference in our neighborhood at levels presumably around .5.

Mattson: The EPA program that had existed for setting standards was entirely abolished in the EPA. Supposedly there is a small group of safety people at the FCC that worry about these things but there is not much evidence that they're putting out standards these days.

N28: Roger Mattson has worked for 35 years in the field of nuclear and radiation safety. During the early 80's he was a director of a division at the EPA with responsibility for the oversight of non-ionizing radiation.

Roger Mattson: Well in the case of ionizing radiation standards the limits that people impose on nuclear power plants and other uses of ionizing radiation are 10's to hundreds of times lower than where any chromosomal or DNA effects can be observed in the laboratory. In non-ionizing radiation that simply isn't the case. The standards such as those that exist, 200 microwatts per square centimeter are set where thermal effects, physical effects are observable well above where chromosomal effects have been observed.

Len: Why are the Russian standards more stringent than ours?

Roger Mattson: Well the Russians are very smart in technology and sometimes we don't want to give them credit for that. They had enormous technology programs in the soviet era and some of them continue today. They were using non-ionizing radiation in ways we hadn't dreamt of before we began to use it and were competing with in the cold war. Their research may have gone further than our research is all I can say to account for why their standards would be so much lower. It's also possible that since they have less commercial use of these sources there hasn't been a lobby in their country to keep the standards high as there has been in our country.

Len: Why don't we hear more about this in the news?

Mattson: I think perhaps it's that the American people have not had their consciousness raised about the potential effects of chronic exposures to low levels of non-ionizing radiation.

N29: Doubtful that health arguments will hold much sway with the County Commissioners, Lookout Mountain residents focus on the increasing interference problems they experience at their homes and businesses. Wheelchair malfunctions, erratic behavior of electronics from pacemakers to garage door openers, it was not difficult to find people whose lives had been impacted by electromagnetic radiation.

Gary Olhoeft: The kind of research required to do that Uses geophysics, if they build this tower, we already have trouble enough with Lookout Mountain, we'd have to move that research field to some place outside of Golden.

Bob Crowder: We're getting noise coming from the speakers of computers. We cannot work with our induction equipment our electromagnetic coils. What this is going to require us to do if the levels get worse is one of three things. We can contact the FCC and file a complaint on interference. We can build an RF clean room. The third choice we have is that we can relocate and in all likelihood that would be the choice we would be forced to do.

Sister: I'm sister Bernadette Gushano and I'm the administrator at Mother Cabrini Shrine here in Golden. We use an electromagnetic gate opener in the morning and in the evening to provide safety for our facility. Frequently during the day, this gate closes automatically.

Len: Is there any chance this could be an act of God?

Sister: I doubt very much if it would be an act of God. That happens when we have electrical storms or lightning.

Jim Hill: I just reached down and just went to hit the joystick to turn around and go back home and turned completely around 180 and took off.

Lee King: I came back out and the car had completely locked up.

Chris Leahy: Two people who were up visiting the Nature Center came here and they had parked their Ford Explorers right where that station wagon is parked.

Jim Hill: I went off the cliff and they said that I went out about six feet before I hit I ever started to descend.

Chris Leahy: Their cars wouldn't start.

Lee King: I had to get a locksmith to get into the car.

Chris Leahy: In both cases we had to call the triple A.

Patty: You know, one lady's hearing aids. She can hear the radio on her hearing aids. That's like Chinese torture.

Jim Hill: The wheelchair came down and crushed my chest.

Patty: You know, the water drip. You can never get away from the station because it's in your ear.

N31: Hoping to work out a settlement between the Lookout Mountain residents and the broadcasters, the Jefferson Economic Council invites the warring factions to a round table meeting.

Leo Bradley: What I said was that I really feel that the topography of our state with this mountain area being what it is and everything, whether you like it or not, I think that these high mountain peaks are your finest broadcast sites.

Tom Clark: My feeling was that the broadcasters felt they were on safer grounds with their proposal and were then less willing to look at a common ground with homeowners. So the meeting ended up pretty much a frustration for everyone. But I do believe that there was an accommodation but we could never get to that part of the conversation.

Lines were so deeply drawn in the sand that it just became impossible.

N32: The question of potential adverse health effects continues to impact the debate over the new tower. Several weeks before the case comes before the County Commissioners, the Colorado Department of Health releases the results of its health study on the citizens of Lookout Mountain. Rumors had it that the report would show a cancer cluster amongst residents resulting from radiation from the antenna farm.

Hoffman: If I had a home up here, I would not sell.

N33: The study shows there is a cancer cluster on Lookout Mountain. But the citizens have hoped for evidence pointing to a connection between the radiation from the towers and the cancer clusters. The study was not designed to find the cause of the cancers, but the media draws its own conclusions.

Headlines

N34: Dr. Paul Polak, a medical doctor with a background in research explains.

Paul Polak: People were talking about the probable connection between smoking and lung cancer for a long time. But it was for a long time controversial and the industry did all kinds of studies disproving any association and that's a very striking and clear causative effect. In this one we're in the early stages. We haven't done the controlled studies that need to be done and it could go either way but the trend as I read it is there is likely some connection but it's not at all a proven connection.

N35: For some, the publicity surrounding the release of the health study creates new problems.

Jenny Werner: We hope that we'll sell the house before the word gets out. I mean that we don't want to lose any money on our home. But we firmly believe too that once the word gets out, the county will do the right thing and take the antennas down.

Steve: We want to sell our house cause we're building a new house. We want to sell our house this spring. And I'll tell you, when the newspapers play that there is a three hundred per cent higher incidence of brain cancer on Lookout Mountain, it's going to kill the real estate up here for awhile.

Selsted: I think the economic impact of this act would be catastrophic to the county. The loss in taxes paid by people within three and a half miles of the tower would be in

the range of one and a half million dollars per year. The property taxes paid by the people who want to build the tower are $36,000 per year. On the other hand, I think the decision to build the tower would certainly be well received by the real estate community. It effectively would be the realtor relief act. Signs would sprout all over the mountain, people selling at whatever price they could get.

N36: Still there are issues that plague the residents of Lookout Mountain.

Steve Howards: It's just that as many ideas as you can come up with, that's how many conflicts we have.

Ron: We were not particularly well organized up to that point.

N37: Realizing the Lookout Mountain residents are badly understaffed, inexperienced and unable to reach consensus on key issues, community leader Jan Wilkins joins the steering committee.

Jan: The commissioners get inured to, you know, hand wringing. What they really need is, you know, legal reason, legal basis for denial. And so to do that you have to build a team that is going to supply all of the components for the basis for denial. You need zoning experts, you need attorneys.

N38: The Board of County Commissioners will meet on three separate days over three months to hear the broadcasters' application for the new super tower. In the meantime Lookout Mountain residents refine their arguments.

Jan: Lake Cedar Group hasn't seriously considered alternative sites because they want to maximize their profits and they own the land. And there are very good alternative sites available that would not directly affect people.

Scott Albertson: And it just kind of jumped off the page at me that television and radio towers are an industrial use of property and are not compatible with surrounding residential.

Hutchinson: Alternatives today essentially make broadcasting as close to obsolete as can be.

SUBTITLE

County Clerk: (Swearing in)...testimony that you are about to give is the truth, the whole

truth and nothing but the truth?

Voices: Yes.

Ragonetti: You'll find that the populated portions of Lookout Mountain have RF levels which are many times below the national standard for human exposure, the standard you adopted and the standard the FCC requires.

Hutchinson: What happened to the homeowners in Three Mile Island because they believed that their children were under risk? What happened to those people? They bailed out and their property became virtually absolutely worthless. But, it was under the federal standard for nuclear radiation in the environment.

Ragonetti: You can't broadcast under the FCC licenses and you can't exist under the county zoning unless you and the mountain are in compliance.

Scott Albertson: Well, respectively, there have been two sets, at least two sets of measurements taken on the mountain in the last seven or eight months that have not been in compliance. Two weeks ago, a week ago, the county went back out and there are again areas that are not in compliance so the mountain apparently doesn't need to be in compliance for the broadcasters to continue to operate on the mountain.

Ragonetti: .....Resulted in an immediate reduction in RF in the areas most impacted, including, most importantly, the block groups two and three which were the focus of the Colorado Department of Health study.

Kevin: Basically, these guys have chosen their words very carefully. If you go back to their exact language that they're referring to, the fact that the most troublesome emissions in these block groups will be eliminated well you know that's because the hotspots will probably move a little bit but the overall emissions in the community are not going down, they are going up.

N39: Responding to pleas from residents for a more complete health study on the Lookout Mountain cancer clusters, Representative John Witwer submits a bill to the Colorado Senate calling for a detailed study. The study will have an open account and will not require state funds. The broadcasters and their consultants lobby hard against the bill.

STATE CAPITOL

Ragonetti: Most other major television markets will be on the air with digital television in November of 1999. You're going to have, some where on the order of a million front range viewers saying, "Why don't we have it here when they have it in Seattle, Portland, and San Francisco, etc.?"

Dr. Cindy Kelly: It's risk versus benefit day to day. So we're looking at the health hazard to the community both real and perceived versus the benefit here, which is better resolution on the TV screen.

Dr. Cole: In a most unusual turn of events, the editor for the New England Journal of Medicine in which that paper was published came to the conclusion that the issue had been studied enough for awhile and it was clear that no further research was immediately necessary in the area of ELF.

Votes in the Colorado Senate: No, aye.

N40: By an overwhelming majority, the broadcasters convince the Senate subcommittee to abandon the new study.

N41: Once again the broadcasters win. They have defeated the residents in the Planning Commission hearings, the first health study didn't show a correlation between the towers on Lookout Mountain and the cancer clusters, and now they have effectively eliminated any chance for a more detailed health study. The string of defeats has a devastating effect on the Lookout Mountain residents.

Deb: This hurts and we don't want to abandon the fight and we don't intend to abandon the fight but we have put so much of our personal resources into this fight that it's hurting. It's thousands and thousands of hours of time. And, but our children are here.

N42: In their search to find relevant material to support their claims that radiation can cause cancer, leukemia or even DNA damage, Lookout Mountain activists are surprised by the relative lack of independent research on the subject. Blake Levitt.

Blake: And every time a research effort for RF has been attempted to be initiated, it doesn't come about. That's also not an accident. You can't find what you're not looking for. The reason that the telecommunications researchers for the CTIA, the researchers for the WTR went on strike for a year, until the industry indemnified their research, the reason that they did that is because they saw what was happening to the researchers for the Tobacco Institute who were being named as individuals for these lawsuits. What they wanted was complete indemnification for that in perpetuity because they know

what's happening behind the scenes.

Dr. Mattson: No research. It is an amazing situation. The growing intensity of non-ionizing radiation everywhere in the country, you'd think would be something we would prudently want to look into to see what levels we wanted to stop this development at or to limit it to. But nobody is paying any attention to that in our government that I know of.

Len: How do you explain the lack of research?

Mattson: Well, our economic boom in America is largely driven by this technology, cell phones and microwave ovens and nobody has raised the question of how much is enough and how safe is enough for this technology.

Len: What's the FCC's role in all of this?

Mattson: Well, the FCC is both a regulator and a promoter of uses of non-ionizing radiation. In the 1970's when the Atomic Energy Commission was both a regulator and a promotor of sources of ionizing radiation, the people of America broke it up into the Nuclear Regulatory Commission and the Department of Energy. That might be the ultimate solution for this issue.

N43: Dr. Henry Lai is one of the few independent scientists in the United States doing research on the biological effects of EMR.

Dr. Lai: One of the things that we found out was that the radio frequency radiation can cause DNA damage in cells. I have a paper that will be published in bioelectromagnetics I think in two or three months that shows that the intensity and duration can trade with each other. That means low intensity, long duration is equal to high intensity, short duration.

Mt. Vernon Party.

N44: Surprisingly, the setbacks ignite a new spirit in the community. The efforts of the leaders have not gone unnoticed. People who had been holding back begin to come forward.

Jan: ...the broadcasters that we are committed and that we're in for the long haul.

HEARING #2

Engineer Jules Cohen: Based upon his work and supported by calculations of my own....

N45: Sensing that the broadcasters are again gaining the upper hand. Lookout Mountain residents begin to take a harder line.

Cohen: ..is in compliance with the FCC and Jefferson County.

Attorney Deboskey: With all due respect to Mr. Cohen, he is the engineering and health poster boy of the broadcast industry. And you should know that he is not an independent scientist. He has made his living testifying and working for broadcasters.

Dr. Cole: If radio frequency causes cancer in human beings, I don't know how. It is virtually, certainly not a DNA disrupter. I understand that that has been disputed by a CARE expert and I would only point out the position that it cannot disrupt DNA is the consensus opinion.

Attorney Deboskey: And if Jules Cohen is the poster boy for the broadcast industry, which I submit he is, Dr. Cole is the health effects poster boy for the entire electromagnetic radiation industry. His career was marked with many years as being associated with the Electric Power Research Institute which is the power industry's equivalent of the Tobacco Institute performing, "independent" industry funded research on the effects of the product which they sell. With Dr. Cole and Mr. Cohen you have not, you have not heard independent science. Rather, I respectfully submit to you that what you have seen and heard from Dr. Cole and Mr. Cohen is the most expensive dog and pony show that this applicant could buy.

Dr. Mattson: There is no public safety agency in RF. EPA's program died five, six years ago. The public health decision has flown downhill and it's on your desk.

N46: Dr. Ross Wilkins is an orthopaedic oncologist and president of the Musculoskeletal Tumor Society. He attended the County Commissioners hearings.

Dr. Wilkens: The basic defect that we see in all cancer has to do with DNA damage and it's been shown unequivocally in hundreds, hundreds of studies that the same radiation that comes off those towers causes DNA damage. And when the DNA is damaged, you can lose control of cell growth and that thus causes cancer and that is a scientific fact. And for someone to sit there and say, don't worry about it, it has no effect is absolutely ludicrous. In my early days as an orthopaedist, I was involved with

a lot of hemophiliacs, kids. And they would receive blood products just to prevent them from bleeding to death. I mean it was an essential thing. Well we started seeing very unusual infections in these young children, in these hemophiliacs. Very unusual, never seen before. We went, we went to the epidemiologist and said, "What's going on, there's some things wrong, help us figure this out." And they looked at things, of course, this was early, they looked and they said don't worry. We can't find anything wrong. These are just sporadic cases. These are nests and all of the jargon that they use and said don't worry about it, it's fine. Well, as it turned out, in point of fact, all of those kids had aids. You cannot assume that no harm will be done unless you have the facts and it takes time. And to put the population of Lookout Mountain and that area under an experimental status saying, well let's put the towers up and see what happens is just ridiculous and should not be done.

Auction sounds. $25

Steve: The auction was just a great success and this is a example of where bake sale meets corporate America.

Narrator: For the citizens of Lookout Mountain, favorable treatment by the press is critical. They don't get it. The majority of editorials come down on the side of the broadcasters.

Greg Dobbs: The thrust of my column is simply this: Maybe there are excessive electromagnetic radiation emissions from the towers, maybe there aren't. But if I even slightly suspected that there were, that they could affect the health and well being of me and my family, I'd move. And partly because of that, I just don't buy the explanations of people who say, we think this is killing us prematurely, but we're going to fight it, we're not going to move. And there is a bigger issue than a political fight like that and that's life and death.

Jan: We think this is a matter of life and death but we're not going to run from it. This is a community of great character and we're not going to pass this off to some unsuspecting people that would move in if we all sold our houses and ran.

Shirley Olinger: And guess what. We are up against big business and big government who has lots of money to lobby and it's no different than the tobacco industry except that we don't have the media on our side at all.

Jan: If any other industry was perpetrating this type of industrial and environmental hazard on a neighborhood like ours, the media would be all over the story. But in this

case the perpetrators are the media and that is why the general public has very little knowledge of the potential environmental hazards.

Steve: You know you have to stop and say to yourself, are we getting kind of a little paranoid? Is this crazy imagining? And when you do a little research, you realize it's not. Cause you stop and think when you're fighting this kind of fight, who do you go to? You go to the media who you hope is sympathetic and will help you educate the public and decision makers about the value of what you're saying.

N48: In spite of their failure to win the support of Denver's major newspapers, Lookout Mountain supporters are optimistic.

Cathy McNeil: I really like to believe ultimately in the goodness of people. The people are going to listen, our commissioners, our leaders, and listen to what the public has to say. But I think our efforts are critical because I think without those efforts we don't show a united front, and we don't show that we really care. And I think that the commissioners aren't going to care if we don't really care. So, that's what I think.

Dr. Ron Larson: I think that we've got a 99% chance.

N49: But the high hopes of the citizens erode when they learn that the broadcasters will tell the Commissioners that they will use directional antenna to reduce interference and radiation in Lookout Mountain's residential areas.

Steering Committee at Deb's house:

Deb: However, at 3:35 Lake Cedar Group's attorney told Don that they're going to go with directional antennas.

Attorney Scott: The only reason they're changing their proposal is cause they know they're going to lose.

Hislop: So we can just go back and get the snippets of tape and see what momentous changes in technology have occurred in the last few months.

BOCC #3

Ragonetti: And it's only within the last week or so that we were told that yes it's possible and we were given tentative designs for antennas. And in fact it was as late as Thursday and Friday when we played with the final design.

Lauren: This is my life and this is my home as well as to many other people. And I think it's a small price to pay.

Ragonetti: The guiding question you have to ask yourself is how can the leading TV stations of Denver who basically live and die by public goodwill propose in good faith something which would have that kind of health effect?

Jan: And we have good neighbors. We are good neighbors. These are not good neighbors. They're condescending, they're reckless, they treat our concerns about our health with contempt, they've exceeded the FCC standards, they write letters to the general community describing us as fanatics and other misleading comments. What happens if the towers become the predominant neighbors on Lookout Mountain? Do you think the good neighbors will stay? I don't think so.

Ragonetti: It's also why we've enjoyed editorial support with a number of papers including the Post and News. It's why we received the six to one recommendation of approval from the Planning Commission. And it's why I would ask you to do the same and to approve it. Thank you for your time and consideration.

N50: By unanimous vote, the Jefferson County Commissioners reject the high definition TV supertower.

Jeff: Well let's go to Disneyland.

AT THE PARTY

Scott: It's about as much fun as you can have with clothes on.

Jan: It's a plateau. But we all know that's it a big battle but not the war.

On July 13, 1999 the Jefferson County Board of Commissioners unanimously vote to deny the new HDTV super tower.

On August 12, 1999 the broadcasters bring suit against Jefferson County claiming the Lookout Mountain residents were allowed to present "prejudicial and irrelevant material" during the hearing.

On November 2, 1999 the broadcasters petition the FCC to pre-empt local zoning control of Jefferson County Commissioners.

Appendix S

FCC Report of 1/4/99

OFFICE OF ENGINEERING AND TECHNOLOGY
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C.

SUMMARY REPORT

SECOND FCC SURVEY AT LOOKOUT MOUNTAIN ANTENNA SITE
(performed December 16, 1998)

Submitted by: R. Cleveland, J. Ulcek
January 4, 1999

BACKGROUND:

On December 16, 1998, Robert Cleveland and Jerry Ulcek, of the Federal Communications Commission's Office of Engineering and Technology, conducted a second measurement survey of radiofrequency (RF) radiation levels in publicly accessible areas at the Lookout Mountain, Colorado, antenna transmission site. This survey was a follow-up to the initial measurement survey conducted on October 29, 1998. The purpose of this second survey was to confirm that actions have been taken by broadcast licensees at the site to bring non-complying areas into compliance with FCC RF exposure guidelines, as recommended by FCC staff after the initial survey.

As before, measurements were made in three general areas: (1) public roads and other accessible locations near the KOSI/KKHK FM transmission tower, (2) generally accessible areas near the KHIH-FM tower, and (3) accessible areas and public roads near the tower supporting KRMA-TV and FM stations KUVO and KCFR. Survey equipment used was a Wandel and Goltermann (W&G) EMR-30 broadband meter and a Holaday Model 3001 broadband field meter connected to a Model GRE E-field probe (attempts to use a Narda Model 8718 broadband meter connected to a Model 8722B conformal E-field probe, as before, were unsuccessful due to non-functioning of the equipment). The W&G and Holaday instruments are not "normalized" to read values as percent of guidelines (as does the Narda equipment). However, since the signals being measured were primarily due to one or two (FM radio) sources at each location this should only result in values that, if anything, were overly conservative. Agreement between these two instruments was generally good, and within acceptable measurement range. For frequencies of 30-300 MHz FCC limits for continuous exposure of the public are 200 microwatts per square centimeter (200 $\mu W/cm^2$).

Compliance with FCC guidelines is based on spatially-averaged readings. Therefore, all measurements reported here are spatially-averaged as measured from just above the ground

to approximately head-height for an adult (1.8-2.0 meters). The W&G instrument performs spatial averaging automatically. However, this is not the case for the Holaday 3001 instrument. Therefore, spatially-averaged readings for the Holaday instrument were estimated "by eye" and recorded. Although this latter method is not the most desirable, agreement between the two instruments was actually very good. The readings reported below are based on averaging the values obtained from both the W&G and Holaday instruments at various measurement points. Actual readings have been corrected to incorporate manufacturer-specified calibration factors. A more detailed report of measurement data will be available at a later date.

RESULTS:

Results of the October survey had indicated that there were certain locations on Lookout Mountain where FCC limits for continuous exposure of the general public ("general population/uncontrolled" exposures) were exceeded. By selectively having certain stations go off the air during the FCC survey, it was determined that the relatively high levels measured were overwhelmingly the result of emissions from certain nearby FM antennas at each location. Contributions from the television antennas in the vicinity were relatively low when compared with those from the nearby FM antennas.

As a result of this survey it was concluded that certain actions needed to be taken to bring the Lookout Mountain site into compliance with FCC guidelines for continuous exposure of the general public, and FCC staff made specific suggestions and recommendations for accomplishing this. Several options were previously noted for immediately reducing the potential for excessive exposure. However, in the long-term, eventual relocation of some or all of the FM antennas is expected to result in significantly lower ground-level RF electromagnetic fields.

(1) Publicly accessible area on property owned by KMGH, Channel 7, and others, and adjacent dirt roadway. The highest readings of the survey were found at this location. Since this area was not fenced, there was no restriction on public access. In the area generally encompassing the dirt driveway leading to KMGH's fenced transmitter building spatially-averaged readings were obtained in October that were as high as 250% of the FCC limits for public exposure. Also, in the dirt roadway leading to the Channel 7 driveway readings obtained in October in a few locations were in excess of the public limits, ranging up to about 140% of the limits in one area. By having KOSI and KKHK go off the air briefly it was conclusively shown that the excessive levels in these areas were predominantly due to the KOSI/KKHK signals. This is not surprising since, because of the topography of the area, this location appears to be essentially in the main beam of the KOSI/KKHK antenna. By having Channel 7 briefly go off the air, it was further confirmed that the FM stations were, by far, the greatest contributors to exposure in this area.

FCC Jan 4 Report

It was recommended that a combination of fencing, posting warning signs, and/or power reductions or increase in antenna height (for KOSI/KKHK) would be appropriate measures to take in this area. Fencing options recommended by FCC staff included: (a) installation of fencing to restrict the entire area, including the driveway leading to the Channel 7 tower as well as the adjacent dirt roadway, or (b) install fencing that includes only the Channel 7 property and take other actions with respect to KOSI/KKHK to reduce exposure on the dirt roadway.

As of December 16, temporary fencing had been installed around the area generally including the Channel 7 driveway. More permanent fencing will be installed later. Also, as recommended previously, standard RF "warning" or "alerting" signs have been prominently posted at regular intervals around the fenced area. Additionally, KOSI and KKHK have reduced operational power to 16.9 kW (KOSI) and 13.5 kW (KKHK), respectively, representing reductions of about 20% (KOSI) and 10% (KKHK) from FCC-authorized power levels.

On December 16, measurements were made in and around Cedar Lake Road in the area closest to the KOSI/KKHK tower. In addition, measurements were made in and around the Channel 7 driveway, specifically, in areas around the newly installed temporary fencing. Spatially-averaged measurements on and near Cedar Lake Road ranged from about 62 to 102 $\mu W/cm^2$. These measurements are well within the FCC-adopted limit of 200 $\mu W/cm^2$ for the FM radio frequency band. Further up the hill, on the platted, dirt roadway in front of, and below, the Channel 7 driveway, spatially-averaged readings in excess of the guidelines were found in October. This area was surveyed again on December 16 with resulting spatially-averaged values ranging from about 85 to 139 $\mu W/cm^2$, well within FCC guidelines. (69.5 MPE)

Areas around the temporary fencing were then surveyed. Although the areas on the Channel 7 property where the highest readings were made in October have been enclosed by temporary fencing, there were still a few areas outside of the temporary fencing where the 200 $\mu W/cm^2$ limit (spatially-averaged) was exceeded. For example, the highest spatially-averaged readings made in the area outside of the fencing located in front of (generally east of) the green metal building ranged from about 255 to 332 $\mu W/cm^2$. These elevated readings could be obtained generally out to where the edge of the terrain drops off steeply. Below this area (at the foot of the steep drop) readings were within FCC limits. In certain other areas to the side and behind the green building, spatially-averaged readings were obtained that ranged from about 178 $\mu W/cm^2$ to 283 $\mu W/cm^2$. Some of these areas exceeded the 200 $\mu W/cm^2$ limit and should be fenced. However, these areas were generally localized and typically covered no more than a few square feet each.

Jeff Pinkerton, representing KOSI/KKHK, was present during all of these measurements, and FCC staff indicated to him the areas where additional fencing was necessary, including the area generally east of the green building and the other localized areas to the sides and behind the green building. Since the December measurements, photographs have been submitted to FCC staff showing that the areas with elevated readings have now

FCC January 4 report

been enclosed by temporary fencing, as recommended. This temporary fencing should provide adequate notice and restriction of public access until a more permanent fence is anticipated once local approvals have been obtained.

(2) **Wooded area near KHIH tower.** This is an area that is generally accessible to the public, although because it is forested it is not clear that there is significant public access. Spatially-averaged readings were obtained in October over a fairly wide area near the base of the KHIH tower. The highest spatially-averaged values at that time ranged from about 110% to 220% of the FCC's limits for public exposure at various locations within this area.

15.6 kw Ath.

As a result of our October findings, KHIH reduced power to 7.5 kW (approximately 48% of FCC-authorized power). Measurements were made on December 16 in the same areas where elevated readings were recorded in October. These latest spatially-averaged readings ranged generally from about 78 $\mu W/cm^2$ to 173 $\mu W/cm^2$ (about 39% to 87% of the limit). However, at one very localized area there was still a slight elevation above the 200 $\mu W/cm^2$ limit (average reading of approximately 232 $\mu W/cm^2$). Therefore, KHIH was asked to reduce power further (down to 6 kW, or about 39% of authorized power). The spatially-averaged value in this location then dropped to an average spatially-averaged reading of about 184 $\mu W/cm^2$ (92% of the limit), which is in compliance with FCC guidelines. After this final reduction in power, no other areas were found near the KHIH tower where spatially-averaged readings exceeded the 200 $\mu W/cm^2$ limit.

(3) **Area in immediate vicinity of KRMA-TV/ KUVO/KCFR-FM tower.** This tower is immediately adjacent to Colorow Road, a paved, public road with a fair amount of traffic. In two locations, one adjacent to the tower and the other directly across Colorow Road, spatially-averaged readings were obtained in October that were slightly in excess of the public exposure limits. In very localized areas adjacent to the tower (near top of concrete stairs and adjacent to a telephone pole) spatially-averaged readings were obtained up to about 190% of the public limits, and across the road from the transmitter building the spatially-averaged readings were up to 104% of the public limits.

As a result of our October study, a temporary fence has been erected around the localized areas adjacent to the KRMA tower where elevated readings had previously been found. In addition, KCFR had reduced operating power to approximately 12.15 kW (about 97% of authorized power) and KUVO had reduced power to approximately 5.68 kW (about 98% of authorized power) in accordance with our earlier suggestions for possible power reductions to bring these stations into compliance.

FCC staff re-surveyed areas across the Colorow Road from the tower and outside of the newly-fenced area near the tower base. Spatially-averaged readings across Colorow Road and on the road itself were all below the 200 $\mu W/cm^2$ limit. Spatially-averaged measurements made in localized areas near the tower, and outside the newly-fenced area, were on the order of 182-184 $\mu W/cm^2$. At one very localized area a spatially-averaged reading slightly in excess of 200 $\mu W/cm^2$ was obtained. The two stations were then asked to further reduce

power. After this further reduction, the spatial average at this location dropped to about 174 $\mu W/cm^2$. No other spatially-averaged readings could then be found over the 200 $\mu W/cm^2$ limit. At this point KCFR was operating at 10.7 kW (about 86% of authorized power) and KUVO was operating at 4.76 kW (about 82% of authorized power).

CONCLUSION:

The fencing that has now been installed in the vicinity of the Channel 7 and Channel 6 towers should provide adequate demarcation and restriction to prevent public access to high-RF areas until such time as more permanent barriers can be erected. This along with the reductions in operating power for KOSI, KKHK, KHIH, KCFR and KUVO, have, in the opinion of FCC staff, brought the Lookout Mountain site into satisfactory compliance with FCC guidelines for exposure of the general public to RF electromagnetic energy.

Appendix T

Dr. Hutchison's Report

Economic Impact Study

Property Value Declines Associated with the *Perceived Medical Harm* from a Proposed High Definition Television Broadcast Antenna

Lookout Mountain
Jefferson County
Colorado

by

Roger S. Hutchison, Ph.D.

email: rshutch@cdrominc.com

March 28, 1999

Introduction

A problem has arisen in the community which lives adjacent to the current analog antennas on Lookout Mountain in Golden, Colorado, which centers on the perceived medical harm associated with higher levels of microwave radiation with the new HDTV broadcast antenna. The perception of many of the residents on Lookout Mountain is that increases in background microwave radiation will lead to an increase in certain forms of cancer and other harmful medical conditions. A large elementary school called Ralston is located within the region of coverage further increasing these concerns. Whether or not these perceptions of medical harm are based on proven medical science is debatable. Whether or not the perception of medical harm is real or not, is not.

The validity of the various schools of thought in regards to real medical harm associated with microwave radiation, and supporting or disputing the medical and scientific efficacy of these schools of thought is beyond the scope of this analysis. This analysis is concerned solely with the effects to the value of personal property within the region of these perceived effects of microwave radiation and in turn the resulting effects in property tax revenue to Jefferson County. The study does not cover commercial interests or educational, State and Federal facilities within the region.

Methodology

The method used in this study establishes a baseline for the value of the average property within two specific regions. The first region is the widely accepted zone of influence of radiation effects with the existing towers on Lookout Mountain. For the purposes of this study, this region of influence is set at 1.5 miles which is widely claimed to be the same region of effects of the existing microwave antennas on Lookout Mountain. The region is a circle whose epicenter is the geographic center of the current antenna cluster. The study assumes that there are 1,280 homes within this zone with an average current property sale value of $208,017.00 in1998. We call this Zone 1(see Map #1).

The second region is Zone 2 (see Map #2). Zone 2 is the region of effects assumed to be relevant once the high definition television antenna is installed and operational. Zone 2 includes Zone 1. This zone 2 has a radius of effects moving from the geographic center of the proposed antenna and moving outwards in a circle for 5 miles. This analysis assumes that the average property value of homes within this expanded region had a value in 1998 of $195,105.00. There are 11,629 homes within Zone 2. Zone 2 extends to the near-by regions of Riva Chase, and into the City of Golden although economic impacts in this study are limited to only residences with single family, duplexes, triplexes condos and town homes. All other property types, such as commercial, i.e. businesses , apartments, agricultural and government owned properties were not included.

Assuming that there are 1,280 homes with a current market value of $208,017.00 each, the property assets within Zone 1 in 1998 have a market value of approximately $ 270.3 million dollars. At a tax rate of approximately 105 mils, this asset generates approximately $3.0 million of tax revenue to the County Government. If you extend this asset assessment to Zone 2, the tax revenue base is now increased to 11,629 homes with an average current market value of $2.38 billion generating approximately $25.0 million in tax revenue to the County.

For purposes of this study, it is assumed that the average property has increased in value since 1989 by 85.3% in Zone 2 and 98.7% in Zone 1. These property value increases were established by information provided by the Jefferson County Assessor's office and are real figures. In 1989, the average property in Zone 1 was worth $110,502.00 and by 1998 the same property was worth $208,017.00 In 1989, the average property in Zone 2 was worth $110,502.00 and by 1998 this same property, on average, was worth $195,105.00.

We assume that these same growth rates will apply over the next 10 years, if all things remain equal. Specifically, we assume that from 1999 to the year 2,010, the average property in Zone 1 will increase in value by 98.7% and the average property in Zone 2 will increase by 85.3%. We use the reference year 2010 instead of 2,009 because the taxable year is based on the previous year's valuation.

If these calculations are correct, then Zone 1 property values increase to a taxable asset base of $537.1 million by the year 2010. Zone 2 property values increase as an asset base to $4.41 billion by the year 2010. The corresponding tax revenue is increased 98.7% going to approximately $6 million in Zone 1 and $46.3 million in Zone 2. This tax revenue is the annual revenue collected by the County for private property within the two zones.

A final assumption in this study is that the perception of medical harm associated with high definition television microwave broadcast signals within the exposed region will have a negative impact on the valuation of residential homes within the effected zones. For the purposes of this study, this negative impact starts as a multiplier, or factor with a base year of 1998 as 0 and moves to a high of .15 or 15% within 10 years. (See note #1)

Results

These hard figures, and assumptions, lead to the following economic impact results.

Zone 1: Economic Impact on Individual Home Values in the year 2010: Decline in Value of $62,000.00

Average home price should be $413,329.00. Average home price is $351,330.00. Net loss to the home owner is $61,999.00 of equity. Net cumulative loss to the County in taxable property assets of $79.4 million. Lost property tax revenue on declines in values totaling $833,700.00 per year.

Zone 2: Economic Impact on Individual Home Values in the year 2010: Decline in Value of $54,000.00.

Average home price should be $361,529.00. Average home price is $307,300.00. Net loss of equity to the homeowner is $54,229.00. Net loss of taxable property to the County is $591.8 million. Net loss of taxable revenue to the County is approximately $6.2 million per year.

Cumulative 10 Year Property Value Effects:

Average Home Owner Equity Decline:

- **Equity Decline: $61,999.00 per home Zone 1**
- **Equity Decline: $54,229.00 per home Zone 2**

Jefferson County: Year 2000-2010: Asset Value Decline: $79.4 million Zone 1
Year 2000-2010: Asset Value Decline: $591.8 million Zone 2

Jefferson County: Cumulative 10 year Tax Revenue Loss: $8.3 million Zone 1
Cumulative 10 year Tax Revenue Loss: $62.0 million Zone 2

Conclusion

The *perception of reality* is that living within a five mile radius and having a direct line of sight of a high definition television antenna can cause medical harm to human beings. This perception may not be based on medical or scientific fact but causes serious concerns within the affected community. This perception of reality makes property within the effected zones less attractive to both existing occupants, as well as prospective new buyers. This perception of reality can have the same negative effect on the valuation of property as "real" effects. The overall result in this perception is a tangible decline in property values which has two fundamental and real impacts. The first impact is on the equity value of private property, which declines significantly. The second impact is on the future lost tax revenues generated at the County level due to property valuation declines. This later effect has long reaching negative impacts on the ability of the County government to fund education and other programs within its legal jurisdiction.

Facts and Assumptions

Fact #1: There are 1,280 homes with an average home sale value of $208,017.00 in 1998 within a 1.5 mile radius of the existing antenna farm on Lookout Mountain.

Fact #2: There are 11,629 homes with an average home sale value of $195,105.00 in 1998 within a 5 mile radius of the proposed HDTV tower on Lookout Mountain.

Assumption #1: The average taxable mil rate is 105 mil. The actual range is 82 to 115. Resulting taxes are based on the taking the property value, multiplying times a State posted rate of 9.74%, and then multiplying times the mil rate. Example: If your house is worth $100,000.00, then multiply this times 9.74%, then take this figure and multiply times .105 to find out how much the County charges for your taxes. Answer: $1,022.70.

Assumption #2: The average property values in Zone 1 will increase by 98.7% from 1999 to the year 2010, the same rate of growth as experienced from the previous 10 years from the base year of 1998.

Assumption #3: The average property values in Zone 2 will increase 85.3% from 1999 to 2,010, the same as the previous 10 years from the base year of 1998.

Assumption #4: There will be a negative effect on the value of homes within a 1.5 mile and 5 mile radius of a high definition broadcast antenna due to the *perception* that microwave radiation is medically harmful.

Note #1. There are three ways to calculate this multiplier. First, a *survey technique*. A survey could be constructed whereby prospective buyers would be asked how much they would pay for identical homes where one is next to a possible cancer producing microwave antennae, and the other home is not. Questions asked in this survey would be, for example, "how much would you pay for a home with 4 bedrooms, three baths and 3,000 square feet in a residential community". The question would be altered to ask the same information, with the caveat "with a microwave antennae which may produce cancer". The questions would be asked in such a way that the only variable which is altered is what people were *willing to pay* for exactly the same home but with one in a region of perceived medical harm.

A second way to determine the decline in value multiplier is a *case example* approach of property valuation declines in similar cities for similar reasons. For example, a recent case in North Barrington, near Chicago, found that homes within the adjacent community of a 150 foot cellular tower decreased the value of the properties by 4.6 to 11.2%, according to the Lake County Board of Review. The homes were de-valued due to "visual pollution". Other examples of this type of decline in value effect have ranges up to 30-40% of the value of a home depending on the specific external impact. In no case studies found was there an *increase* in the value to a residential home as a result of an antennae farm, or single antennae or tower.

The third way to determine the decline in value multiplier is the *Delphi approach* where industry experts are asked. In this case, the *experts* are real-estate agents familiar with the effects to property value as a result of adjacent environmental impact causes, such as the effect to property valuation around the Three Mile Island accident site, and other similar environmental spill-over cases.

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that Lookout Mountain is a unique site, and implying that the Council is somehow part of a concerted effort to keep KTVJ from entering the Denver market.[2/]

The Council strongly denies taking part in any conspiracy to thwart competition in the Denver television market. The Council has a variety of technical and business reasons to explain why it cannot allow KTVJ onto its tower, and why it is unwilling to move to KTVJ's tower. Moreover, Newsweb does not meet the three-prong test required to invoke § 73.635, and fails to explain why the Commission should rehear the § 73.635 issue it already decided twice against Newsweb in connection with prior Petitions to Deny.

The Newsweb Claim Under §73.635 is Barred by Collateral Estoppel

As noted above, Newsweb argues that the Council controls, or has acted in concert with a group which controls a "unique site," as defined by 47 C.F.R. § 73.635 (b). Furthermore, Newsweb asserts that the Council has violated §73.635(c) by not making its tower available as the transmitter site for KTVJ. Newsweb made these same arguments in its petition to deny the assignment of the licenses of stations KEZW(AM), Aurora, Colorado, and KOSI-FM, Denver, from D & D Broadcasting, Inc. to the Tribune Denver

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2/ Newsweb has adopted a cynical strategy of blaming others for its own problems. For example, back when it was seeking an extension of its construction permit in BMPCT-910412KE (its 15th extension!), Newsweb argued that it was a victim of an "improper" and "persistent campaign by local land mobile licensees" including local police and fire departments. Indeed, Newsweb urged that these parties were part of some nationwide conspiracy to co-opt Channel 14 for land mobile purposes. These ridiculous characterizations were challenged in an Informal Objection filed by Adolph Coors Company and Martin Marietta Astronautics Group on June 5, 1991.

Radio, Inc., an affiliate of the licensee of Station KWGN-TV in Denver. D & D Broadcasting, Inc., 71 RR 2d 1174 (1992).

In that proceeding, Tribune sought a waiver of the "one-to-a-market rule",[3/] because a transfer of the D & D radio stations would result in Tribune owning attributable interests in a television station (KWGN-TV) and an AM and FM radio station in the same market. Newsweb alleged that Tribune had already engaged in anti-competitive behavior by denying KTVJ(TV) access to the KWGN tower in violation of § 73.635. The Commission rejected Newsweb's arguments, ruling that the unique site rule was not applicable.[4/]

The FCC found that Newsweb failed to make even a prima facie case that Lookout Mountain was a "unique site,"[5/] and that the Denver "market is served by a substantial number of television broadcasters [thus] Newsweb has not met its burden under Section 73.635(c)."[6/]

About the same time, Newsweb also petitioned to deny the application of Channel 31 Licensee Corporation to assign the licensee of station KDVR(TV), Denver, to 31 Licensee, Inc., a subsidiary of Renaissance Communications Corp.[7/] Newsweb

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3/ 47 C.F.R. § 73.3555(b).

4/ D & D Broadcasting, Inc., 71 RR 2d 1174, 1175-77 (1992).

5/ Id. at 1176.

6/ Id. at 1177.

7/ File No. BALCT-920917KG

made the same argument: that it had been denied access to the KDVR transmitter site in violation of § 73.635.

In a letter ruling dated January 11, 1993 (reference 8940-PRG), the Chief, Video Services Division, rejected Newsweb's standing to petition to deny the KDVR assignment. Nevertheless, the Division treated Newsweb's filing as an informal objection and rejected its argument on the merits. The Division noted that it had addressed the § 73.635 argument in the D & D Broadcasting case and found that the "Denver market is served by a substantial number of television broadcasters, and that the rule therefore does not apply in that market." Renaissance, at 2.

The same result is compelled in this case. It is well-established that FCC licensing proceedings are adjudications subject to the principle of collateral estoppel, or issue preclusion.[8/] The four elements necessary to apply collateral estoppel[9/] are present in this case: (1) the applicability of the "unique site" rule to TV transmitter sites on Lookout Mountain is identical to an important issue raised in D & D Broadcasting and Renaissance; (2) the Commission made a final judgment on the merits in those cases, ruling against the applicability of the "unique site" rule; (3) Newsweb was a party to those proceedings; and (4) Newsweb had a full and fair opportunity to litigate the issue.

8/ RKO General, Inc., 82 F.C.C. 2d 292, 313 (1980); see also Gordon County Broadcasting Co. v. F.C.C., 446 F.2d 1335, 1228 (D.C. Cir. 1971)(F.C.C. invocation of collateral estoppel in licensing proceeding upheld).

9/ Montgomery County Media Network, 4 F.C.C. Rcd 3749, 3750 (1989).

In its Petition to Deny, Newsweb, perhaps aware of its collateral estoppel problem, attempts to suggest that the FCC never really addressed the § 73.635 issue in D & D Broadcasting, and that Renaissance misinterpreted the decision in D & D Broadcasting.[10/] Yet, the Commission made clear that it was addressing the merits of the § 73.635 claim in the beginning sentence of paragraph 8 of its D & D Broadcasting decision: "With regard to the substantive matters raised by Newsweb concerning Section 73.635...."[11/] The Commission left little room for doubt that it was deciding the merits of Newsweb's argument. Renaissance correctly found that the FCC had addressed Newsweb's claims.

Newsweb does not, indeed it cannot, offer any evidence to suggest that circumstances have materially changed since the Commission ruled on this issue on November 25, 1992 and again on January 11, 1993. In fact, Newsweb's Petition to Deny as filed against KRMA-TV's renewal, is a virtual copy of the Petitions to Deny it filed in the previous proceedings. It would be a waste of public and private resources for the Commission to reexamine issues in the instant case, brought by the same party,

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10/ Newsweb Petition to Deny, p. 15.

11/ D & D Broadcasting, at 1176.

adequately litigated and decided by the Commission only two and four months ago.[12/] On this ground alone, the Commission should reject Newsweb's Petition to Deny.

Section 73.635 is Inapplicable

Even if the Commission decides that the applicability of § 73.635 to the Denver market was not adequately decided in D & D Broadcasting and Renaissance, Newsweb has failed to demonstrate that the "unique site" rule should apply to prevent or condition the grant of renewal of KRMA-TV's license. Just as it did in the previous objections, Newsweb merely "recites the history of its unsuccessful efforts to locate a site for an antenna tower on Lookout Mountain,"[13/] and makes the indisputable but irrelevant observation that Boulder is a community that deserves television service. These observations are hardly adequate under § 73.635.

In order for § 73.635 to apply, Newsweb must prove three facts: a) that the Council owns or controls a site unavailable to other television licensees; b) that no other comparable site in the area is available; and c) that the exclusive use of the KRMA-TV site restricts television competition in the area. A petitioner must prove that all three

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12/ Newsweb has now apparently filed virtually identical pleadings against the renewals of all the TV tower owners on Lookout Mountain, including KWFN-TV, Channel 2; KCNC-TV, Channel 4; KMGH-TV, Channel 7; KUSA-TV, Channel 9; and KDVR(TV), Channel 31. This shotgun approach exacerbates the abusive nature of Newsweb's conduct.

13/ D & D Broadcasting, at 1176.